Automatic Conversion of an Episodes Script to a 3D Movie

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Abstract

In the project Machine Understanding for interactive StorytElling (EU ICT FP7 FET) at KU Leuven, we have introduced a new way of exploring and understanding textual information by "bringing text to life" through 3D interactive storytelling. As one step in the conversion of any text to a 3D movie, in this paper, we present an approach to convert a script of a television series written in natural language to a knowledge representation which can be used to generate a 3D movie automatically. We analyse all the challenges and difficulties of the automatic conversion from the text format/quality to the performance of state-of-the-art natural language processing softwares.

The knowledge representation includes action templates, which are used to generate the 3D movie. An action is represented with an action name and a list of parameters. For example, an action MoveTo should contain a Character who is the mover, an Object to which the character moves, and a MovementType such as "run", or "walk". We detect entity mentions and semantic frames in the scripts by using coreference resolution and semantic role labeling. The entity mentions are referred to as the main characters, and the semantic frames are mapped to the action templates. We evaluated the technology with scripts of the television series of Grey's anatomy. One of our main results regard the adaptation of the existing Hobbs algorithm for coreference resolution to our problem domain while obtaining an F1 of 0.872. Another contribution is to extract and classify nouns as classes of characters, props and locations with an F1 of 0.750. Finally, we obtained an F1 of 0.737 for our conversion of textual scripts to action templates.